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Japanese Unexamined (*Kokai*) Patent Publication No. S64-30194, published February 1, 1989; Application No. S62-184013, filed July 23, 1987; Inventor: Jinzo NAKAGAWA; Assignee: Matsushita Denki Sangyo KK [Matsushita Electrical Industrial Co., Ltd.]

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## MICROWAVE HEATING DEVICE

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### 2. Claim

Microwave heating device characterized in being provided with a microwave oscillator; an isolator connected to the oscillator; a branched waveguide tube wherein the end of one side is connected to the isolator, and the end of the other side is branched in a multiple form; and microwave heating chambers that are successively connected to the ends of the other side of the branched waveguide tube.

### 3. Detailed Explanation of the Invention

#### [Field of Use in Industry]

The present invention concerns a microwave heating device.

#### [Prior Art Technology]

In recent years, the popularization of heating devices using microwaves has been remarkable. They have a wide variety of applications; for example, they are used in microwave ovens for cooking, in so-called high-frequency heating furnaces for the hobby of pottery, and the like.

If the needs described above were present in one household, two or more microwave ovens would be necessary, and this would be uneconomical since would involve an expense. Thus, a method has been discussed (i.e., Japanese Unexamined (*Kokai*) Patent Publication No. S50-58342 [published in 1975]) whereby one microwave-

generating heat source is used, and microwaves are selectively offered on one of two heating tanks. Based on this, the heating tanks are divided into two, the respective separated chambers and microwave oscillator are connected by multi-branched waveguide tubes, and the supply of microwaves into the respective chambers is carried out by electromagnetic shielding plates that can be freely switched.

[Problems the Invention is Meant to Resolve]

However, with this type of conventional method, a portion of the microwaves passing through the multi-branched waveguide tube from the microwave oscillator is reflected, and it has been made clear that this often adversely affects the microwave oscillator.

The present invention resolves the aforementioned conventional problems, and the objective is to obstruct microwaves reflected from a microwave heating chamber.

[Means for Resolving Problems]

In order to achieve this objective, the microwave heating device of the present invention is comprised of a microwave oscillator and multiple microwave heating chambers which are connected by means of branched waveguide tubes through an isolator.

[Operation]

Based on this composition, even when microwaves that are emitted from the microwave oscillator side are reflected by a microwave heating chamber, the reflected waves are obstructed by an isolator, and are not transmitted to the microwave oscillator side.

[Embodiments]

Embodiments of the present invention are explained below with the use of drawings.

Figure 1 is a planar view of the main parts of an embodiment of the microwave heating device of the present invention, and Figure 2 is a block diagram thereof.

A microwave output terminal of a microwave oscillator is installed on one end side of a coaxial waveguide tube (2), and on the opening of the other end of the coaxial waveguide tube (2), one opening end of an isolator (3) is connected. In Figure 1, the coaxial waveguide tube (2) is not shown.

On the other opening end of the isolator (3), one end of a branched waveguide tube (4) is connected, and in the branched position of the branched waveguide (4), shutters (5, 6) which open and close freely are arranged to guide this to an optional branching direction. (7, 8) are motors for opening and closing the shutters (5, 6). On the other end of the branched waveguide tube (4), microwave heating chambers (9, 10), of a number corresponding to the number of branches (two in this embodiment), are serially connected.

Based on this embodiment, by opening one of the shutters (5, 6) and closing the other, microwaves can be selectively supplied to either of the microwave heating chambers (9, 10) from the microwave oscillator (1).

Figure 3 is a planar diagram of the main parts of another embodiment of the present invention.

The greatest structural difference between this embodiment and the embodiment shown in Figure 1 is that the supply of microwaves to either of the microwave heating chambers (9, 10) can be switched with one shutter (11). That is to say, the shutter (11) is

arranged on the branched part of the branched waveguide tube (4), and one part of the branched path is opened and the other is closed by means of a motor (12). Based on this, the composition can be simplified, compared to the embodiment shown in Figure 1.

By having three or more branched paths of a branched waveguide tube and providing a shutter on the branched parts, multiple microwave heating chambers may be arranged and microwaves may selectively be supplied thereto.

#### [Results of the Invention]

Based on the present invention as described above, because an isolator is interposed between a microwave oscillator and a microwave heating chamber, microwaves reflected from the heating chamber can be obstructed, and microwave chambers can be used for multiple objectives.

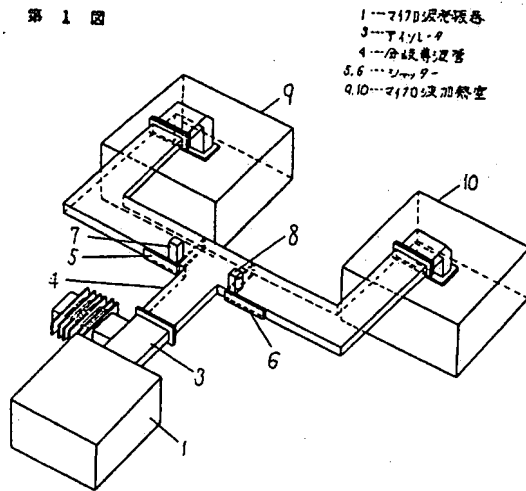
#### 4. Simple Explanation of the Drawings

Figure 1 is a planar view of the main parts of an embodiment of the microwave heating device of the present invention, Figure 2 is a block diagram thereof, and Figure 3 is a planar diagram of the main parts of another embodiment of the present invention.

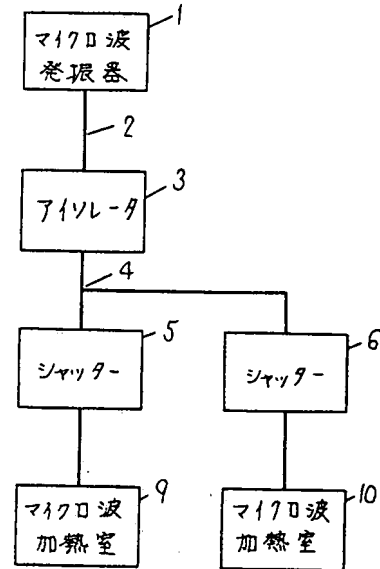
1: microwave oscillator; 3: isolator; 4: branched waveguide tube; 5, 6: shutters; 9, 10: microwave heating chambers; 11: shutter.

第 2 図

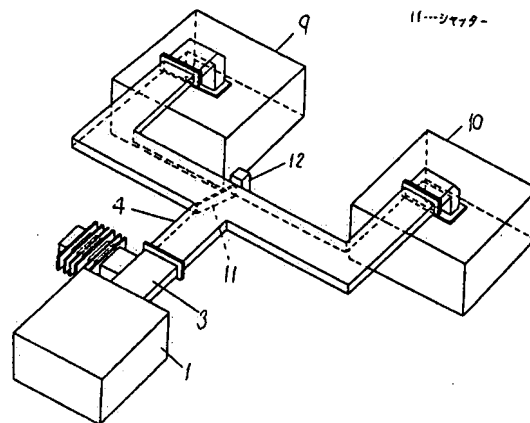
第 1 図



2...同軸導波管



第 3 図



11...シャッター